



PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference P200301296	FOR FURTHER ACTION		See Form PCT/PEA/416
International application No. PCT/DK2004/000526	International filing date (day/month/year) 06.08.2004	Priority date (day/month/year) 06.08.2003	
International Patent Classification (IPC) or national classification and IPC G10L11/00, G10L15/02			
Applicant LEONHARD, Frank U.			
<p>1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of 7 sheets, including this cover sheet.</p> <p>3. This report is also accompanied by ANNEXES, comprising:</p> <p>a. <input checked="" type="checkbox"/> sent to the applicant and to the International Bureau a total of 2 sheets, as follows:</p> <p><input checked="" type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).</p> <p><input type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.</p> <p>b. <input type="checkbox"/> (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) , containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).</p>			
<p>4. This report contains indications relating to the following items:</p> <p><input checked="" type="checkbox"/> Box No. I Basis of the opinion</p> <p><input type="checkbox"/> Box No. II Priority</p> <p><input type="checkbox"/> Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</p> <p><input type="checkbox"/> Box No. IV Lack of unity of invention</p> <p><input checked="" type="checkbox"/> Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</p> <p><input type="checkbox"/> Box No. VI Certain documents cited</p> <p><input type="checkbox"/> Box No. VII Certain defects in the international application</p> <p><input checked="" type="checkbox"/> Box No. VIII Certain observations on the international application</p>			
Date of submission of the demand 01.06.2005		Date of completion of this report 06.02.2006	
Name and mailing address of the international preliminary examining authority:  European Patent Office - P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk - Pays Bas Tel: +31 70 340 - 2040 Tx: 31 651 epo nl Fax: +31 70 340 - 3016		Authorized Officer Santos Luque, R Telephone No. +31 70 340-2594 	

**INTERNATIONAL PRELIMINARY REPORT
ON PATENTABILITY**International application No.
PCT/DK2004/000526**Box No. I Basis of the report**

1. With regard to the **language**, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.
- ☐ This report is based on translations from the original language into the following language, which is the language of a translation furnished for the purposes of:
- ☐ international search (under Rules 12.3 and 23.1(b))
 - ☐ publication of the international application (under Rule 12.4)
 - ☐ international preliminary examination (under Rules 55.2 and/or 55.3)
2. With regard to the **elements*** of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:

Description, Pages

1-12 as originally filed

Claims, Numbers

1-8 as amended (together with any statement) under Art. 19 PCT

Drawings, Sheets

1/7-7/7 as originally filed

- ☐ a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing

3. ☐ The amendments have resulted in the cancellation of:

- ☐ the description, pages
☐ the claims, Nos.
☐ the drawings, sheets/figs
☐ the sequence listing (*specify*):
☐ any table(s) related to sequence listing (*specify*):

4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

- ☐ the description, pages
☐ the claims, Nos.
☐ the drawings, sheets/figs
☐ the sequence listing (*specify*):
☐ any table(s) related to sequence listing (*specify*):

* If item 4 applies, some or all of these sheets may be marked "superseded."

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Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	1-8
	No: Claims	-
Inventive step (IS)	Yes: Claims	1-8
	No: Claims	-
Industrial applicability (IA)	Yes: Claims	5-8
	No: Claims	1-4

2. Citations and explanations (Rule 70.7):

see separate sheet

Box No. VIII Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

see separate sheet



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Re Item V

**Reasoned statement with regard to novelty, inventive step or industrial applicability;
citations and explanations supporting such statement**

For the purposes of formulating an opinion on the questions of whether the claimed invention appears to be novel, to involve an inventive step and to be industrially applicable, the subject-matter of claim 1 has been interpreted as it might be reasonably expected to be claimed by amendment taking into account the contents of the description and drawings (see section VIII of the present report).

V.1 Article 33(2) PCT

Reference is made to the following document:

D1: US-A-5 422 977 (PATTERSON ET AL) 6 June 1995 (1995-06-06)

The document D1 is regarded as being the closest prior art to the subject-matter of claim 1, and shows (the references in parentheses applying to this document):

A method for analysing an input having an input frequency-bandwidth, the method comprising:

- providing at least one-frequency bandwidth limited portion of the input signal (col. 3, lin. 34-40),
- determining for each of the at least frequency-bandwidth limited portion of the signal, durations of a predetermined number of half-periods and signal magnitudes during respective predetermined number of determined half-periods (col. 7, lin. 27-42),

The subject-matter of claim 1 differs from this known method in that the claimed invention determines a "distribution of the signal magnitudes as a function of their durations of the predetermined number of half-periods" (see VIII.3 below).

The subject-matter of claim 1 is therefore new (Article 33(2) PCT).

V.2 Article 33(3) PCT

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Although the method of document D1 also generates images from waveforms, the procedure followed differs from the procedure of the application (as interpreted in section VIII). There is no hint in document D1 that would prompt the skilled person to modify the known method in a way that it arrives to the method of the application. Since the subject-matter of claim 1 is not obvious, it meets the requirements of Article 33(3) PCT, regarding inventive step.

Claims 2-8 are dependent on claim 1 and as such also meet the requirements of the PCT with respect to novelty and inventive step.

V.3 Article 33(4) PCT

The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claims 1-4 is not industrially applicable in the sense of Article 33(4) PCT.

Having regard to the wording of the independent claim, the person skilled in the art would not recognise the use of the method of claims 1-4 in any kind of industry (see PCT Guidelines 14.01, 14.04), the reasons being as follows:

It would be necessary for the skilled person when faced with the claimed invention to carry out further research in order to identify a "real-world" context of use (see PCT Guidelines A14.01[1](b)). In addition, it would not be possible while carrying out the method of claim 1 by a person skilled in the art to realize the indicated special purpose of the invention (see PCT Guidelines A14.01[2].1(3)), which is further defined in dependent claims 5, 7 and 8.

Therefore, the combination of the additional features of claims 5, 7 or 8 with the subject-matter of claim 1 does comply with the requirements of Article 33(4) PCT, since the skilled person would recognise the purpose and the utility of the methods claimed. These combinations of features are consequently considered to be industrially applicable and, as a result, a positive opinion is given on claims 5-8 in the sense of Article 33(1) PCT.

Re Item VIII

Certain observations on the international application

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The application does not meet the requirements of Article 6 PCT, because claims 1, 4, 5, 7 and 8 are not clear.

VIII.1 The term "half-period" used in claims 1, 4, 5, 7 and 8 is vague and unclear: a "period" would be understood by the skilled person as the distance in time between two consecutive occurrences of a periodic waveform. For instance, in the high frequency band of figure 3 of the application, the period would be approximately half the duration of the depicted signal. However, it appears from the description on page 7, lines 11-16, that "half-period" is meant to represent the duration in time between two consecutive peaks of the signal. The ambiguity of the term leaves the reader in doubt as to the meaning of the technical feature to which it refers, thereby rendering the definition of the subject-matter of said claims unclear, Article 6 PCT.

VIII.2 Claim 1 does not meet the requirements of Article 6 PCT in that the matter for which protection is sought is not clearly defined. The following statement, found in claim 1,

"determining signal magnitudes during respective predetermined number of determined half periods" conveys the impression that any signal magnitude may be determined during the predetermined number of "half-periods". However, according to the description (see i.a. page 7, lines 11-16), the peak-to-peak values have to be determined.

 VIII.3 Claim 1 does not meet the requirements of Article 6 PCT in that the matter for which protection is sought is not clearly defined. The following functional statement do not enable the skilled person to determine which technical features are necessary to perform the stated function:

"determining a distribution of the signal magnitudes as a function of their durations of the predetermined number of half-periods."

According to the description in page 7, lines 13-16; page 8, lines 1-2 and page 10, lines 15-20, said distribution is obtained by "sorting the measured peak-to-peak values after the durations of their corresponding half-periods of the oscillations and

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accumulating said values numerically."



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Claims (amended):

1. A method for analysing an input signal having an input frequency-bandwidth, the method comprising
- 5 - providing at least one frequency-bandwidth limited portion of the input signal,
- determining, for each of the at least one frequency-bandwidth limited portions of the input signal, durations of a predetermined number of half-periods and signal magnitudes during respective predetermined number of deter-
- 10 mined half-periods, and
- determining a distribution of the signal magnitudes as a function of their durations of the predetermined number of half-periods.
2. A method according to claim 1 wherein the signal magnitudes are determined as peak-to-peak values.
- 15 3. A method according to claim 1 comprising rectifying each of the at least one frequency-bandwidth limited portion of the input signal, and determining the signal magnitudes as the signal magnitude between two consecutive zeroes.
- 20 4. A method according to any one of claims 1-3 wherein the predetermined number of half-periods is one half-period.
5. A method according to any one of claims 1-4 wherein the distribution of the signal magnitudes as a function of their durations of the predetermined number of half-periods is used for identifying vowels in a speech signal.
6. A method according to claim 5 wherein the at least one frequency-bandwidth limited portion has a bandwidth of at least one octave.
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7. A method according to any one of claims 1-4 wherein the distribution of the signal magnitudes as a function of their durations of the predetermined number of half-periods is used for identifying a condition of an industrial product.

- 5 8. A method according to any one of claims 1-4 wherein the distribution of the signal magnitudes as a function of their durations of the predetermined number of half-periods is used for identifying a condition of a physiological signal in a human or animal body such as a nerve signal.

